

Value Analysis Program



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EXECUTIVE SUMMARY

The Federal FY 04/05 has been an eventful year for the Department's Value Analysis (VA) Program. In the beginning of the year, the VA Program experienced a complete turnover in staffing. The interim staff was instrumental in the success of the VA program. Staff proceeded to focus on establishing a solid fiscal management base while streamlining the VA Program processes. With the fiscal management and District work plans in place, the current staff is focusing on maintaining the nationally recognized program and promoting value methodology throughout the Department.

During the summer of 2005, the Department's VA Program underwent a vigorous audit by the Federal Office of the Inspector General (OIG) to assess the Federal Highway Administration's (FHWA) program oversight. OIG requested data from over one hundred projects dating back to 2001. VA Program staff researched and provided status reports on the projects that by OIG's records, needed to comply with the federal Value Engineering legislation. The Department also provided electronic VA report copies to verify compliance and reporting accuracy. The Department identified fourteen projects without documentation for required VA Studies, seven of which were locally led projects. The OIG report of findings and recommendations is still pending.

The VA Program currently maintains two regional on-call A&E contracts to supply the Department with Certified Value Specialist (CVS) as team leaders to facilitate the program's VA studies. Olympic Associates Co.-Martin Hsu Assoc. (OAC-MHA) services Northern California (North Region, Central Region, and District 4), and Value Management Strategies (VMS) services Southern California (District 7, 8, 11, and 12). Together these consultants facilitated thirty-one (31) studies in the Federal FY 04/05. This workload could not have been accomplished without the expertise these consultants provide.

The program's goal is to maximize the value and quality of the projects delivered. Timing is a critical factor when implementing alternatives from a VA study. When a VA study is performed in the early stages of the project the greater the potential impact. Continuous outreach efforts to team members, project managers, and functional managers, will ensure the success of the program. Besides cutting cost, the VA process can be a valuable tool to build consensus among stakeholders, increase stewardship, improve customer service with our partners, solve difficult transportation problems, and improve project quality.

Last year, studies were performed on projects with a total delivery cost of over \$6 billion. In November 2005, the Department reported to the FHWA a savings of \$82 million. These savings were derived from the "Accepted Alternatives" proposed by the VA teams and implemented by the decision-makers, project managers, functional managers, and PDT members. One of these studies was nationally recognized by the FHWA with the "Most Value Added Proposal – Improved Process" award. This was a great accomplishment for the Department.

VALUE ANALYSIS OVERVIEW

WHAT IS VALUE ANALYSIS?

Value Analysis (VA) is a function-oriented, systematic team approach, used to analyze and improve value in a product, facility design, system or service. It is a powerful methodology for solving problems, reducing costs, and improving performance/quality requirements.

The VA Job Plan is an organized plan of action for accomplishing VA studies and assuring the implementation of the recommended changes. Summarized below are the 12 steps, as employed in the Department's VA Program, required to successfully complete a VA study. The process begins with the phase labeled "Identify Project" and ends with the final phase, "Implement Alternatives".

Pre-Study Preparation	Study Performance	Post-Study Implementation
Identify Project	Inform Team	Report Results
Select Team	Analyze Functions	Assess Alternatives
Prepare Data	Create Ideas	Implement Alternatives
	Evaluate Ideas	
	Develop Alternatives	
	Present Alternatives	

Typically, it takes 5 to 6 days to perform a VA study and requires the cooperation of the project/functional managers, resource advisors, and the VA Team members.

The Department conducts three types of VA studies:

- Transportation projects. The use of VA to improve the value of projects has been demonstrated in all Districts since 1969. Transportation VA studies are broken down into two categories:
 - 1) NHS studies which the NHS Act of 1995 mandates.
 - 2) Voluntarily studies that are identified by the Districts.
- Product studies. The VA process can be used to improve the quality of transportation products. Typically, engineering products are items and systems as described in the Department's standard plans and specifications. Value Analysis can help identify products that need to be updated due to changing technology, outdated application, or any other changes that affect our standard engineering products.
- Process studies. The VA process can be used to improve the quality of the Department's processes, such as policy and procedures and business practices.

WHY USE VALUE ANALYSIS?

MAINTAIN FEDERAL FUNDING. Value analysis studies are now required on all projects greater than \$25 million (construction, right of way, and capital outlay costs) on the National Highway Systems (NHS). The project is defined by the environmental document and may include multiple contracts over many phases. The NHS Act of 1995, the subsequent Federal Rule (February 1997- Subpart 627) and the Federal Aid Policy Guide, which added a new Chapter 6, "Value Engineering", define the application of this regulation.

BUILDING CONSENSUS WITH OUR TRANSPORTATION PARTNERS. Partners are becoming the way we do business in the Department. Federal and state legislation over the last several years has given the local authorities a greater role in deciding local transportation issues. Value Analysis is an effective tool to overcome conflicts and build consensus with project stakeholders and partners.

SOLVING DIFFICULT TRANSPORTATION PROBLEMS. The Value Analysis process provides an excellent tool to focus on and solve our most difficult transportation problems. The more complex a project in terms of geometry, staging, environmental impacts, etc. the more opportunity it provides a skilled, well-led VA team to provide an in-depth analysis and subsequent innovative solutions for the project.

COST REDUCTION WHILE MAINTAINING OR IMPROVING PROJECT PERFORMANCE. The Department strives for quality and performance in the Project Development process, while the public demands more for less cost. Project costs should include the total cost of ownership, which includes both the original (construction) cost and subsequent operation and maintenance costs. VA recommendations should not include cost reduction at the expense of project functions.

ELIMINATION OF DETRIMENTAL DESIGN INFLUENCES. The following influences can negatively affect a project's design:

- Lack Of Information
- Time Pressures
- Wrong Beliefs
- Negative Attitudes
- Habitual Thinking
- Rapidly Changing Technology
- Risk Of Personal Loss
- Strict Adherence To "Requirements"
- Reluctance To Ask For Advice
- Poor Human Relations

The VA review process can overcome the above influences by use of an objective, multi-disciplined team of individuals applying the VA methodology in a controlled environment.

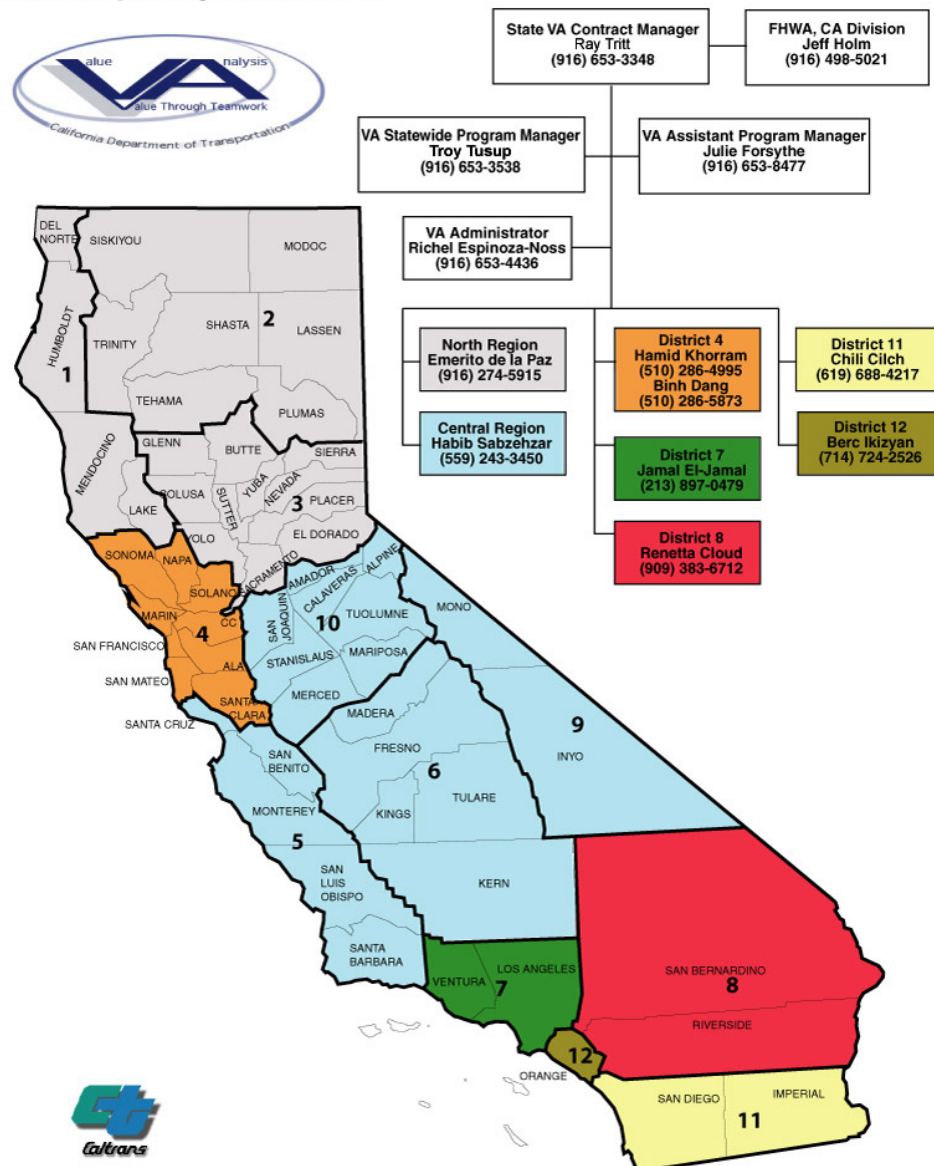
VA PROGRAM ORGANIZATION

The Department has been actively engaged in Value Analysis (VA) for over 25 years and has an expanding program. Both consultants and in-house VA team leaders are used to organize and conduct VA studies, under the leadership of District VA Coordinators (DVAC). The Office of Special Projects under the Division of Design in Sacramento manages the twelve-district VA program for the entire state.

VA Program Mission: Provide stewardship and improve mobility across California through application of the VA methodology on the Department's projects, products, and processes.

VA Program Vision: The Department is a leader in the application of Value Analysis in the transportation industry.

Value Analysis Organization Chart



USE OF CONSULTANTS

The Department currently has two on-call contracts to provide VA services throughout the state. These consultant contracts are regionally divided. Olympic Associates Co. & Martin Hsu Assoc. (OAC-MHA) services the Northern Districts (North and Central Region, District 4, and Headquarters) while Value Management Strategies (VMS) is responsible for the Southern Districts (District 7, 8, 11, and 12).

These on-call contracts for VA services were executed in December 2004 and are valid until June 2007 for a total of \$8 million. Currently in the second year, the VA Program was allocated \$3.6 million to meet its demand. In the past, the Department had reserved the use of the consultants for controversial, high profile projects that needed an independent, objective analysis. However, more recently the VA contracts are helping the Department perform the increased number of studies required to comply with the huge NHS VA Study mandate. With the \$25 million project cost threshold, most of the Department's projects require a VA study.

The Department uses Certified Value Specialist (CVS) team leaders to facilitate most of studies. These contracts allow the Department to hire consultants who have access to nationally recognized CVS team leaders.

2004/2005 PROGRAM RESULTS

During the Federal fiscal year ending September 30, 2005 the Department completed the following value analysis activities:

- Thirty-one (31) studies were completed: twenty-eight (28) transportation project studies and three (3) process studies. An additional eleven (11) transportation project studies were performed, but not completed, and will be reported next year.
- Twenty-three (23) Cost Reduction Incentive Proposals (CRIPs), otherwise nationally known as Value Engineering Change Proposals (VECPs), were submitted by contractors resulting in \$2,256,000 savings (State's share 50%).
- The total estimated project cost of the twenty-eight (28) transportation projects studied was \$6,227,000,000. This included the \$3 billion I-5 improvements from Oceanside to San Diego and the \$1.7 billion for the Mid-County Parkway (SR804) in Riverside County.
- Out of 251 proposed recommendations, 87 recommendations were approved for implementation resulting in \$81,584,000 savings. Table 1 below summarize the results of the VA highway project studies:

Table 1: Value Analysis Studies – Federal FY ‘05

Study Leader	No. Studies	Original Project Costs	Value Analysis Alternatives				Total Study Cost	Return on Investment
			Proposed		Implemented			
		(\$Million)	No.	Savings (\$Million)	No.	Savings (\$ Million)	(x 1000)	
In-house	0	0	0	0	0	0	0	0
Consultant	31	\$6,227	251	\$574	87	\$82	\$1,609	51:1
Total	31	\$6,227	251	\$574	87	\$82	\$1,609	51:1

AWARDS

The Department received national recognition at the 2005 American Association of State Highway and Transportation Officials (AASHTO) Value Engineering Conference. The Department received the following awards:

FHWA Award: “Most Value Added Proposal – Improved Process Award”

Purpose of Award: To recognize outstanding implemented results from a particular VA/VE study done in a given fiscal year.

04/05 Winner: Trash Total Maximum Daily Load (TMDL), District 7, California Department of Transportation

In January of 2001, the California Regional Water Quality Control Board, Los Angeles Region adopted the Trash Total Maximum Daily Load (TMDL) for the Los Angeles River.

The TMDLs set a numeric standard, zero (0), for trash discharge by storm water runoff into the water bodies. The proposed ten-year program intends to reduce trash discharge by 10% each year until the zero discharge is achieved.

The accepted VA alternatives are expected to expedite TMDL program implementation and will improve safety by reducing workers exposure to traffic while performing the work.



Figure 1: Chili Cilch, Acting VA Program Manager, receiving FHWA Most Value Added Proposal – Improved Process Award at the AASHTO Value Engineering Conference in San Antonio, TX.

FHWA Award: “2005 Outstanding Achievement Award”

The FHWA Outstanding Achievement Award is awarded to the State DOT with the most effective VA program. The FHWA considers; size of the VA program, number of studies performed, accepted and conditionally accepted cost savings, and implemented savings.



Figure 2: Chili Cilch, Acting VA Program Manager, receiving FHWA Outstanding Accomplishment Award at the AASHTO Value Engineering Conference in San Antonio, TX.

Caltrans Superior Accomplishment Award

At a time when the department was suddenly without a Value Analysis (VA) Program Manager, Chili Cilch was asked to volunteer to come to Headquarters Office of Special Projects in the Division of Design from District 11 to not only function as the VA Program Manager, but to help get the program back on track during a critical time for the Department. Ms. Cilch agreed and performed these duties while splitting time between her regular duties as a District VA Coordinator in District 11 and in her acting role as Statewide VA Program Manager in Headquarters. As Acting VA Program Manager for a period spanning nearly one year, Ms. Cilch oversaw and directed the streamlining and realignment of business practices within the program. This year's VA accomplishments were a direct reflection of her leadership and commitment.



Figure 3: Superior Accomplishment Award presented to Chili Cilch, District 11 VA Coordinator, by Scott McGowen, former Chief of the Office of Special Projects.

VALUE ANALYSIS TRAINING

The Department maintains an active VA training program so that the engineering and planning staff have the opportunity to learn the VA Methodology before being assigned to VA teams. Since 1982 the Department has trained over 1300 individuals.

The VA program offers three types of training courses:

- **Module 1 Value Methodology Training Workshop** - This course is a 40-hour workshop comprised of 50% lecture and 50% hands-on training. The course is designed to teach the VA Methodology, provide the Department with trained Value Specialists, and motivate employees to participate as team members on upcoming VA studies.

Both the Society of American Value Engineers (SAVE) and the Project Management Institute (PMI) have approved the course. The successful completion of this course allows employees to apply for the Associate Value Specialist (AVS) certification through SAVE. In addition, this course has been approved by PMI and is worth 40 Professional Development Units (PDUs).

- **Module 2 Value Methodology (VM) Training Workshop** - This 24-hour seminar provides a comprehensive overview of advanced VM techniques ranging from FAST diagramming, Value Metrics, and Value Program Management.

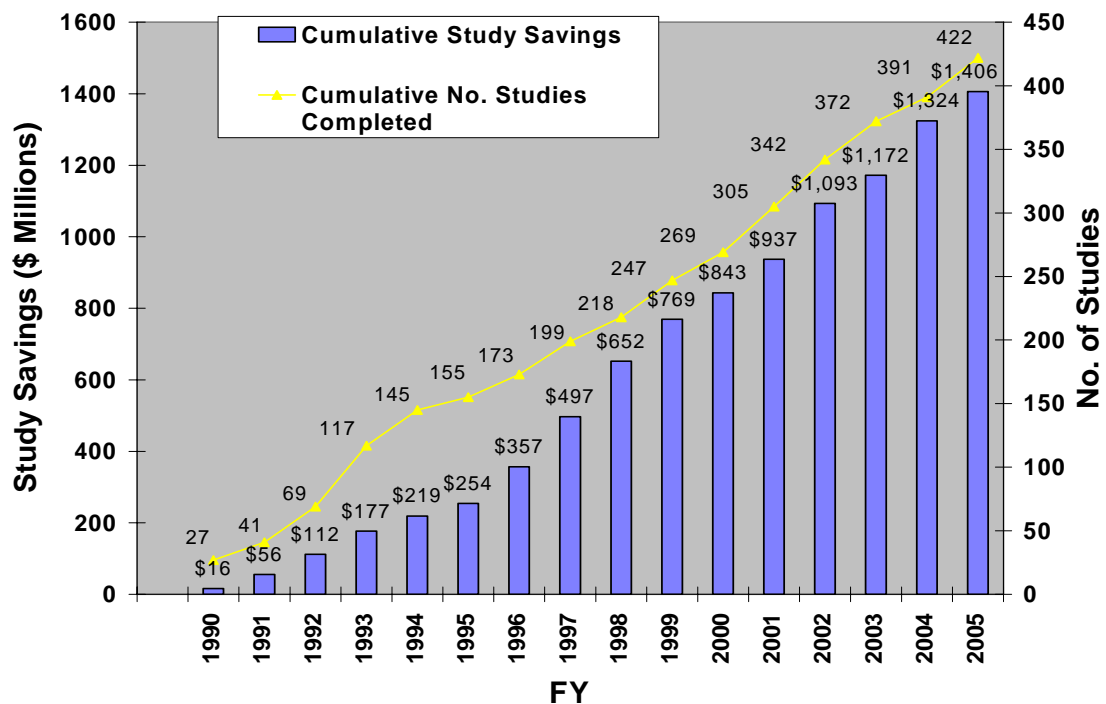
This is a SAVE accredited course that provides students the ability to apply to become a Certified Value Specialist (CVS) from SAVE International.

- **Overview for Project Managers and Management** – This is a two-hour seminar focusing on the roles and responsibilities of Project Managers and functional unit managers. The course is co-facilitated by the Department's VA Program Manager and one VA team leader (consultant CVS). This interactive seminar is designed to give a brief overview of VA Methodology, federal legislation requirements, the Department's VA program work plans, and "when" to use VA in the project delivery process to maximize the benefits from VA.

HISTORICAL HIGHWAY PROJECT SAVINGS

The historical savings from the Department's VA program are presented graphically in the following Charts. Chart 1 shows the Cumulative savings over the past 15 years. Over \$1.4 billion in saving has been realized from the VA Program. Table 2 indicates the number of studies performed by each District over the last 15 years. Chart 2 shows the average implemented savings for each study.

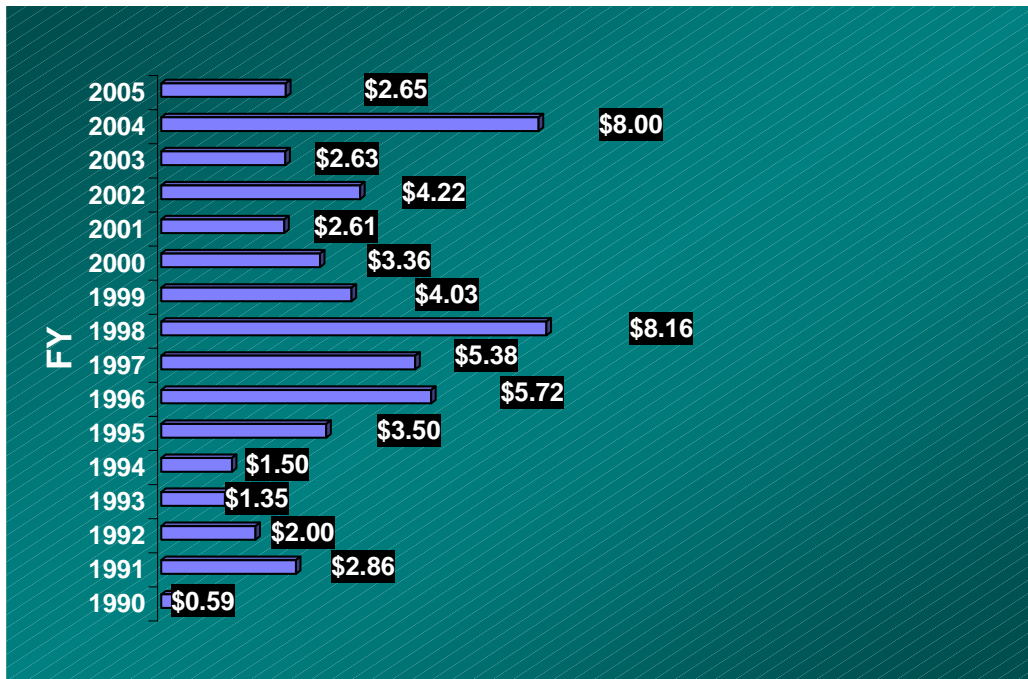
**Chart 1:
VA Highway Project Cumulative Savings**



**Table 2:
Number of VA studies Completed (1990-2005)**

District	Fiscal Year																Total
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
1	1	0	2	3	2	1	1	0	1	0	0	0	3	1	0	1	16
2	2	6	0	6	3	0	2	3	0	1	1	2	1	0	1	1	29
3	0	1	1	2	0	2	1	0	1	2	0	4	1	1	1	3	20
4	2	4	5	6	6	0	8	10	6	6	6	7	15	6	5	4	96
5	1	5	6	0	2	0	0	1	0	0	1	1	1	0	0	2	20
6	0	2	2	4	0	0	0	2	2	2	0	2	1	2	2	2	23
7	1	0	0	4	1	1	0	2	8	7	1	5	6	9	6	5	56
8	0	1	0	7	11	0	1	2	1	2	3	3	4	9	1	9	54
9	2	1	1	2	1	0	0	1	0	0	3	2	2	0	0	0	15
10	2	2	0	1	1	0	0	0	2	0	2	2	0	1	0	1	14
11	2	4	5	12	5	5	3	7	6	6	5	7	1	1	3	3	75
12	0	3	0	1	2	0	2	1	2	3	0	1	2	0	0	0	17
Total	13	29	22	48	34	9	18	29	29	29	22	36	37	30	19	31	435

Chart 6:
Average Savings per Study (in Millions)
 (Average study cost under \$40,000)



UPCOMING EVENTS

- Eleven other studies were performed, but not finalized, in FY 2004/2005. These studies are in various stages of progress and will be reported next year. Over 70 studies are planned for FY 2005/2006.
- New FHWA requirements will increase the number of studies significantly. The new SAFETEA-LU legislation requires ALL projects receiving federal funding and over \$25 million in total project cost to be Value Analyzed. What was once a requirement for VA on NHS projects has now been modified to require analysis on all projects over \$25 million.
- Within the Department's "Project Development Procedures Manual" (aka "Gold Book"), Chapter 19 (Value Analysis) is being updated to reflect the changing business practices of the Department. More guidance on partnering and stewardship will be provided with the update. Also, new FHWA requirements will be incorporated into the chapter.
- The VA Report Guide, the VA Team Study Guide, the VA Procedures Guide and the VA Concepts Guide are being updated to provide standards and procedures for the application of value analysis to highway projects within the Department. The VA study process is being redesigned to capture non-financial benefits of studies in the areas of traffic operations, safety and schedule, and stakeholder consensus building. Mutually exclusive alternatives will be identified to eliminate over-reporting of potential savings and under-reporting of implemented alternatives.
- The Department's VA database will be upgraded to capture all the procedural modifications and to better track study results. The database will streamline the FHWA annual report as well as track the success of the program.
- The Department's VA Program will maintain the VA Website. The website includes; manuals, guides, blank VA Task Order forms, and a complete list of contact numbers for the entire VA Team. The VA database will supply the website with reports that reflect the status of all the VA studies actively in progress as well as completed projects.